Note that one reasons for a decrease in glial brain tumors observed in rats chronically exposed to RF is that NO production may have become greatly stimulated due to evidence above and the excess NO may have killed any glial tumor cells.[36a.36b].

(iv) Implications

Evidence has been presented which demonstrate biological effects to ODC, that at levels of 0.08 W/kg, equal to the Commission's 'safe' average whole body SAR exposure for the general public, and 1/20th of the Commission's general public limit of 1.6 W/kg for the SAR for the head, and 1/100th of the 8 W/kg considered 'safe' for the Commission's limit for occupational/controlled exposure of workers for the co ODC does stimulate NO which has been demonstrated to have adverse effects in the brain and can kill brain cells.

Moreover, these findings provide important evidence that RF exposure at levels deemed 'safe' by the Commission result in significant increases of an enzyme (ODC) critical for proper cell growth, proliferation and differentiation, and significant decreases in the rate at which the by product of cell decay (putrescine) is exported out of the cell. These findings, while perhaps not constituting conclusive proof, certainly allow that if the Commission is to follow its policy of setting limits "out of an abundance of caution[43]," then it should set exposure limits low enough to expect such increases in ODC activity can be prevented.

2.5 Review of observed pathological effects on brain tissue indicate the Commission's limits for exposure to the head are not sufficiently protective

2.5.1 At 0.016 W/kg, which is 1/250th of the Commission's hazard threshold, L. Salford et al find (1994) pathological damage to blood-brain-barrier [141]

2.5.2 At about 0.01 W/kg, which is 1/400th of the Commission's hazard threshold, Oscar et al. (1977) report indications of pathological damage to the blood-brain barrier [93, 94]

2.5.3 At about 0.006 W/kg, which is about 1/600th of the Commission's hazard threshold, it was decided concerning changes to the hippocampus part of the rat brain that, "The demonstrated changes can most probably effect their function and constitutes one of the elements of pathogenesis of early disturbances in people to this environmental factor." [40, 95, 96]

2.6 An accidental exposure of 4 workers exposed to RF for less than 2 minutes provides evidence that the Commission's limits and duty criteria do not protect workers

2.6.1 What happened: An accidental exposure of 4 workers to a continuous wave beam of X band RF[64] demonstrate consistent adverse effects at levels deemed 'safe' by the Commission. [note: the X band is a frequency range of 8.2 GHz to 12.4 GHz[63] and a corresponding wavelength range of 3.7 cm to 2.42 cm, respectively). This incident was reported in an article in the Journal Of Occupational Medicine; of its four co-authors, three are physicians at a naval regional medical center and the other a lieutenant commander in the Department of Radiology at the San Diego Naval Regional Medical Center[64].

Four (4) men were sustained accidental exposures while facing a U.S. Navy fire-control radar that operates in the X-band frequencies. The power density was between 60 to 90 mW/sq. cm and that exposures "occurred in the radiating near field and were from a continuous wave beam from a uniformly illuminated, circular aperture antenna[64]." The 'radiating near field' for this frequency range this would be a distance less than 4 cm.[65,66,67,68], and thus the exposures were most likely partial body exposures. All men were reported to have been in good health The length of time of exposure (assumed at 90 mW/cm^2) and effects reported were:

- Man A and B: 5 and 10 second exposures -

"They both reported "headaches, vertigo and a heating sensation. One noted headache and eructation persisting for 10 days. The other reported lethargy, decreased attention span and forgetfulness for three weeks."[64]

- Man C (called case 1 in article): 80 second exposure:

"At the time of the incident he reported severe chest pain, vertigo and a heating sensation of the chest and head. Facial erythema persisted three days. Postprandial stomach cramps, dysphagia, shoulder soreness and gritty eye sensations occurred with the first day and persisted several weeks. He also experienced rapid onset of recurrent, severe headaches, some of which were preceded by scintillating scotomata; irritability; and emotional lability."[64]

- Man D (called case 2 in article): over 5 minutes was irradiated for 75 seconds of exposure:

"Immediate effects included a heating sensation of his chest and head and a headache. He reported erythema of his chest and face lasting one day. A creatine phosphokinase determination was 2,650 units two days later but promptly returned to normal limits within 72 hours. In the period since exposure, the patient has described nondisabling irritability, insomnia, headaches, photphobia and visual blurring. Four months after his exposure, hypertension of 140/105 mm was detected[64]."

2.6.2: Comments on applicability to Commission limits

Historically transmissions of Commission licensees have been AM radio or FM radio or TV continuous wave frequencies, and thus may not be applicable to typically pulsed radar applications. However, the new digital transmissions do included pulsed applications which are of concern to some researchers[69] and has been raised as a concern by the EPA[70a,b,c,d] as well as FDA scientists[71]. Moreover, the Commission's limits only consider as the factor for determining safety the average SAR, and average power density, and not whether this average is due to any particular pulsed, amplitude modulated, frequency modulated, or other wave transmission pattern.[72]. Thus, if we also consider the importance of prudence, and the Commission's policy of acting "out of an abundance of caution[43]" it appropriate to consider the appropriateness of the Commission's limits as applied to the above incident in 2.6.1.

2.6.3 Relevance of comparing the Commission's exposure limits with that of the incident in 2.6.1

The Commission has noted that the ANSI/IEEE C95.1-1992 RF standards provide additional protections at the higher frequencies where the time averaging periods are reduced as the wave length shortens *"affording a greater degree of protection from skin burning at the higher microwave frequencies*[73]". The Commission notes *"we are not aware of any practical situations involving FCC regulated transmitting facilities where such exposures are likely to occur*[73]."

However, in this case there is reason to presume that for workers repairing or maintaining telecommunications transmitters which have pulsed transmission patterns that the exposure experienced in the above incident may be similar enough so that it is relevant to the transmissions of some Commission licensed facilities; and prudence and acting *"out of an abundance of caution*[43]" would provide for making such an assumption.

2.6.4. Computation of 6 minute and 30 minute average power density based on incident 90 mW/cm^2 exposure

The Commission has suggested that meeting the requirement of being "fully aware of the potential for exposure and can exercise control over their exposure," could be met by *"a sign warning of RF exposure risk and indicating that individuals should not remain in the area for more than a certain period of time*[74]."

Presumably, the "certain period of time" would be computed to assure the Commission's limits were met. The Commission's limits for the X band frequencies (8.2 to 12.4 GHz) are 5 mW/cm2 averaged over 6 minutes (note: for ANSI/IEEE C95.1-1992 the limit is 10 mW/cm2 averaged over 6 minutes - e.g. twice that of the Commission's limit).

Case #A: 5 seconds exposure results in an average 6 minute exposure of 1.25 mW/sq. cm, and an average 30 minute exposure of 0.25 mW/sq.cm[75].

Case #B: 10 seconds exposure results in an average 6 minute exposure of 2.50 mW/sq. cm, and an average 30 minute exposure of 0.50 mW/sq.cm[76].

Case #C: 80 seconds exposure results in an average 6 minute exposure of 20 mW/sq. cm, and an average 30 minute exposure of 4 mW/sq.cm[77].

Case #D: 75 seconds exposure results in an average 6 minute exposure of 18.75 mW/sq. cm, and an average 30 minute exposure of 3.75 mW/sq.cm[78].

2.6.5 Comparison of exposure with both Commission and ANSI/IEEE C95.1-1992 limits

- Commission limits for occupational/controlled for this wavelength is 5 mW/sq. cm average over 6 minutes, and for the general population/uncontrolled is 1 mW/sq. cm averaged over 30 minutes.
- The exposures of both Case A and Case B are within the Commission's 'safe' limits for exposure for both the workers and for the general public
- Peak power considerations:

While the exposure in this instance was from a continuous wave, it is interesting to note that ANSI/IEEE C95.1-1991 provides 'protections' against high peak power density and when there are more than 5 pulses per second, as in this incident, and requires that during any 100 milli-second period there is a limit for this frequency range of 720 mW/sq. cm[79]. Since, the continuous power density in this case was 90 mW/sq. cm, it is seen that the ANSI/IEEE C95.1-1992 'protections' for peak power would still have allowed the observed power density. Thus, pulsed telecommunications transmission patterns, such as TDMA, at the observed power density would still be allowed based on ANSI/IEEE C95.1-1992.

- ANSI/IEEE C95.1-1991 also provides an upper and lower tier of power density limits for partial body exposure which for this frequency range is 21.5 mW/sq. cm and 5.46 mW/sq. cm for the

occupational/controlled and general population/uncontrolled limits respectively[80]. This standard claims these power density limits assure that the local partial body SAR will not exceed 8 W/kg and 1.6 W/kg respectively.

Since in the above incident the 4 men accidently exposed were reported to be in the near field, it can reasonably be presumed that for these 3.7 cm waves, that the men were within a few centimeters of the antenna, and thus it is reasonable to assume there was only a partial body exposure.

2.6.6 Comments on measurements

There may be doubts concerning the accuracy of the reported exposure. The Commission, the federal health agencies reviewing the claims and requests of the Ad-Hoc Association, and others may question the accuracy of the power density reported by the authors and claim it is not sufficiently documented. Were this data to be used in a tort liability case, or were it to be used to established scientific fact, then there may be a requirement for conclusive evidence. However, for the purpose of setting limits for the safety of workers and the public, prudence, due diligence, and caution requires a lesser standard for evidence to be considered, and there is no reason to presume the reported power densities and time periods are incorrect; therefore the Commission should follow its policy of making decisions "out of an abundance of caution[43]," and make decisions as if the reported power densities and time periods are correct.

2.6.7 Conclusions

- Assuming partial body exposures apply as described above, it is seen that ANSI/IEEE C95.1-1992 would consider the all of the above exposures to the 4 men 'safe'.
- Workers whom maintain and repair transmitters of Commission licensees are not sufficiently protected and more stringent limits are needed.

The above information in 2.6 shows a consistent 'dose - response' relationship, where the persons exposed for a longer time had more severe adverse effects. There is a consistent pattern of headaches, and for some more severe effects. Whether the above is sufficient evidence to prove in court that the exposure 'conclusively' caused the effects is uncertain. But from a public health perspective which requires less evidence than a tort liability action, it seems clear that there

is sufficient evidence here for the Commission to act with prudence and due diligence, and to set limits as if the exposure did cause the adverse effect, and to recognize that its present limits are not sufficiently protective.

- The Commission's 6 minute averaging time rule is based on an out-of-date rationale not suited to the conditions of transmission of its licensees. It is understood that originally the main concern for exposure limits was to address exposure from radar installations, including those which rotate. Because of their rotation, the early exposure limits allowed a 6 minute period to assure proper averaging of the exposure. But, the Commission's licensees to do not have rotating transmitters, so there is no need for a period as long as 6 minutes to average the exposure.

Additional support for the 6 minute averaging time being irrelevant is found in the comments of two of the three FDA representatives who were members of the IEEE C95.1-1991 balloting committee and who voted against adopting this standard. Their comments included,

"Little attention has been paid to appropriate averaging time. The standard still uses 6 minutes for frequencies below 15 GHz. Six minutes was arbitrarily chosen and has no significance in terms of thermal loading to cells or any other biological response. There is some work by Wachtel which suggests some maximum values for consideration."[132].

Therefore, let the Commission consider the work of Wachtel, and in particular, a paper summarizing much of his findings and was a paper among the 120 papers found suitable for standard setting by committees supporting the development of IEEE C95.1-1991, and was included amongst the Final List of Papers Reviewed for IEEE C95.1-1991 (see Appendix B of footnote 83). Wachtel et al. report for studies of 1500 MHz and 2450 MHz, found little difference between them for the effects studied, and report threshold effects when the applied power was 0.2 Watts, which is lower than the output of many portable and mobile phones, and it was reported the effect was noted *"after several seconds,"* - thus justifying a very short averaging time to be used when setting standards, as suggested by Drs. Swicord and Altman above.

Concerning pulsed signals, Wachtel et al. report, *"we have found that microwave pulses in the range of 10 to 100 msec may hae increased the efficacy in synchronizing firing patterns. A related effect has previously been reported in frog heart."* Indications that microwaves had effects other than those due to heating were reported, saying, *"convective warming of a bursting neuron caused an increase in IBI (interburst interval), whereas microwave radiation, of*

equivalent thermal consequence, had produced a decrease in IBI." They conclude stating, *"it is almost certain that these effects would be disruptive of ongoing information processes if they were to occur in an intact nervous system."* In a review of this article, EPA effects occurring within 1 second after exposure, and that, *"The authors hypothesized that at a dose rate of 1 W/kg, conversion of 0.1% of the microwave energy into a polarizing current density across the cell membrane would be sufficient to affect the firing rate of pacemaker cells.....* (and that there are effects) *occurring within 1 second* (of the start of exposure)." [footnote 15, page 5-9]

Thus, since the Commission states it defers to the recommendations of the federal health agencies[134], then if the Commission will consider the studies of Wachtel et. al. as was recommended by the FDA representatives of the IEEE C95.1-1991 balloting committee, the Commission will decide:

- to reduce its 6 minute average time to one of a few seconds, since there is evidence that effects *"would be disruptive of information processes"* within this time; this supports the Ad-Hoc Association request of a 5 second averaging time provision.

- to reduce the exposure allowed from mobile phones to the brains of workers (now 8 W/kg) and to the brains of the general public (now 1.6 W/kg) to be below the protection limit associated with the thresholds identified by Wachtel et al., e.g. to apply the traditional safety factor of 100[19] to the threshold of 1 W/kg identified by Wachtel et .al. to get a limit of 0.01 W/kg for both workers and the general public. Note, that based on other evidence in this proceeding this limit could arguably be even more stringent.

Thus, as seen above, adverse effects do occur at exposure conditions which meet the present 'safe' level for workers averaged over a 6 minute period. This observed effect requires the Commission taking prudent action and to reduce the length of averaging period.

Following this approach is also consistent with the NCRP criteria upon which the Commission states it bases its approach. NCRP 1986 states that the determination of nature of the response of an organism to RF energy "rests upon appropriate experimentation and inference, not on presumption." It had been presumed that a 6 minute average was sufficient, yet the above indicates that this presumption needs to change.

Specifically, given the above observed adverse effects, which provided no indication of being at a threshold, the Commission needs to apply at least what is considered the traditional 'safety factor' (or 'uncertainty factor') of 100 that was identified by the EPA[19], and to apply this to the 5 second period at which adverse effects were observed. However, since there is no indication that the exposure was at a threshold, an additional reduction is needed by including another factor of 10. By doing so, some of the uncertainty of effects of a high exposure for a five second period are addressed. Thus, putting aside for the moment all of the other effects noted in this proceeding, based only on the above the limit for 5 seconds of exposure should be 90 mW/sq. cm /100 = .09 mW/sq. cm or about the 90 microwatts per sq. cm.

Therefore, the Commission should:

2.6.7.1 Therefore, the Commission should use a 5 second averaging period or less as the period during which a relatively high exposure may occur, even though a 'long term' average exposure may be less and meet other Commission requirements. This criteria recognizes that this would perhaps not be suitable for radar which rotates - but these are not used for telecommunications. A 5 second averaging period is indicated since an significant adverse effect was observed due to exposure during this short time period. This limit reasonably applies to Commission licensed portable phones and base station transmitters. Also note that evidence given in item 2.3 above and referenced therein shows evidence of a decrease in brain metabolism in less than 2 minutes of exposure.

Since a decrease in brain metabolism may affect thought processes, such as attention span and time to respond to a signal, such an effect could put workers at additional risk, especially if there are at high heights servicing telecommunications transmitters. Evidence for such effects from low levels of exposure was has been reported in the peer-reviewed literature and by the Ad-Hoc Association in this proceeding[81].

2.6.7.2 While 'long term exposure' averaged over 6 minutes or 30 minutes for occupational/controlled and general public/uncontrolled, should meet the more stringent limits requested by the Ad-Hoc Association FCC 96-326 Petition at pages 15-16, exposure for a 5 second period should not exceed 90 microwatts per sq. cm for reasons given above.

2.6.7.3 Moreover, based upon item 2.3 above which shows a decrease in brain metabolism at 0.02 W/kg to the head in less than 2 minutes, it is seen that decreases in brain metabolism occurs at 0.02 W/kg which is an exposure 1/4000th below the 'hazard threshold for the head of (20 x 4 W/kg) - to which a safety factor of 50 for the general population is applied yielding 1.6 W/kg. Therefore, to assure there is not a decrease in brain metabolism, and applying the same safety factors as at present, Commission local SAR values for parts of the body, e.g. the head, should be 1/4000th of their present levels, e.g. 8 W/kg for occupational/controlled instead should be 0.002 W/kg, and the 1.6 W/kg for general population exposure should be 0.0004 W/kg. The Commission should note that these requests are consistent with the requests of the Ad-Hoc Association FCC 96-326 Petition at page 15.

The Commission should also note that these limits are derived from using the same safety factors as at present, and used by the RF standards of NCRP[82], IEEE[83], and IRPA[84]. The Commission should also note that these safety factors are applied to the findings of a series of science based studies which show an almost instantaneous deduction in brain metabolism upon irradiation by RF under certain conditions, and at exposures to the head as low as 0.02 W/kg. Thus, these limits are based upon established recognized safety (or 'uncertainty') factors, and a clear biological effect of decrease in brain metabolism to which the population and workers certainly do not want to be exposed to unless and until such exposures can be shown not to affect brain functioning - and as noted in 2.6.1 there is evidence that there are such effects.

2.7 New information on RF induced effects requires re-evaluation of Commission's limits

It has been recently reported,

"Dr. Om Gandhi made some waves at the science symposium held by NIEHS in March. He challenged one of the most basic objections to EMF health effects raised by some physicists. Gandhi reported that the fields induced in the human body by power lines and appliances - indeed, essentially all strong EMF sources - are much larger that the fields generated naturally inside the body...My assumption was that what is already in the body is pretty substantial, but that turns out to be incorrect,' Gandhi said in an interview. He noted he was 'surprised' by his results. 'It is time for people to reject false assumptions,' he said."[85]

Since it has been suggested that effects seen at power line frequencies are likely to occur at RF modulated at these much lower frequencies, the Commission should ask Dr. Gandhi and the federal health agencies to re-evaluate its limits based on these new findings. These findings, may

also help establish biologically plausible explanations for the effects reported at low levels of RF as documented by the Ad-Hoc Association and others in this proceeding.

2.8. The Commission's ANSI 1982 criteria for licensing hand-held phones does not have a scientific basis, and justifies having all portable phones meet the requirements of new limits to be put into effect.

2.8.1 Statement of Q. Balzano and N. Kuster raises significant doubts about the scientific basis of aspects of the standards the Commission believes to represent "the best scientific thought[53]." The Commission has stated,

"We believe that the regulations that we are adopting herein represent the best scientific thought and are sufficient to protect the public health.[53]"

Part of these regulations include the decision not to require the re-authorizing of hand-held mobile phones authorized in accordance with the Commission's ANSI C95.1-1982 RF exposure standard, and authorized in accordance with the IEEE C95.1-1991 RF standard. For the Commission stated,

"With respect to grandfathering previously-authorized portable, mobile and unlicensed devices, we recognize that it would be impractical to require re-authorization of these devices. Furthermore, we believe that most existing devices already comply with the limits that we are adopting. Therefore, we will generally not require re-authorization or testing of previously approved devices solely to demonstrate compliance with our new RF guidelines[54]."

Thus, the Commission appears to be relying on the previous guidelines being safe and that devices authorized under the previous guidelines will meet the new guidelines. Indeed, this is understandable since the RF standard used by the Commission since 1985, ANSI C95.1-1982, for authorizing portable phones stated,

"It would be unlikely for devices such as low-power hand held radios operating at frequencies below 1 GHz and radiating at rfem (radio frequency electromagnetic) power levels below 7 W to couple enough energy into any size human body to violate the general provisions of the RFPG (Radio Frequency Protection Guide) (which was a local SAR of 8 W/kg)"[55].[sec. 6.11 of footnote 55] [please note that '*radiating*' at rfem power levels below 7 Watts refers to output (radiating) power]

Moreover, ANSI C95.1-1982 determined, *"Furthermore, it is difficult to envision any operating conditions where more than a small fraction of the rfem energy from a 7 W device could be absorbed by a human body."* [sec, 6.11 of footnote 55].

However, it seems more recent studies report otherwise. For example, it is reported by Q. Balzano and N. Kuster[56] that, *"Under some conditions more than 50% of the input power is absorbed in the user as is lost for communications purposes"*[56]. [page 56 of footnote 56]. A study by Kuster[57,58] is then described in which it is shown that at a distance of 10% of the wavelength that about 30% of the total energy output is absorbed by the head[57,58]. Insofar as this 1992 study is included in this 1997 article, it is presumed that its results are consistent with subsequent studies by these authors and referenced by the Commission[59]. Thus, the 30% found in this recent 1992 study shows that the 1982 ANSI C95.1-1991 committee appears to have incorrectly decided that *"it is difficult to envision any operating conditions where more than a small fraction of the rfem energy from a 7 W device could be absorbed by a human body.*[55]*"*

Moreover, the Commission notes that of the six hand held phones in a subsequent 1993 study cited by the FDA, that the worst case model, when placed directly against the head resulted in a localized SAR of 8.8 W/kg per 1 watt of output power.
Thus, 7 Watts of radiating power, which ANSI C95.1-1982 stated, as above, that

"It would be unlikely for devices such as low-power hand held radios operating at frequencies below 1 GHz and radiating at rfem (radio frequency electromagnetic) power levels below 7 W to couple enough energy into any size human body to violate the general provisions of the RFPG."[55]

Yet, it appears that such a portable phone would be result in 61.6 W/kg (7 x 8.8 W/kg) in a localized area of the head, over 7 fold the allowable safety limit. Therefore, it would seem that a number of "industrial" grade portable phones which were designed to output high (up to 7 Watts of power so workers can be a far distance from the transmitter) may exceed the past and present 8 W/kg maximum now allowed for the occupational/controlled setting.

In regard to this topic, it is of interest to note a comment by in a 1997 article co-authored by Dr. N. Kuster and by Dr. Q. Balzano, Corporate Vice President of Motorola and the Director of the Corporate Electromagnetic Research Laboratory, and who was a member of the ANSI C95.1-1982 Subcommittee IV on Safety Levels and/or Tolerances with Respect to Personnel of the ANSI C95 Committee. In this article it is stated concerning the above ANSI 1982 exclusion of low power devices,

"Right from the onset of the development of the dosimetric concept (measuring radio signal energy absorbed by the body), *it became obvious that handheld mobile*

telecommunications equipment would exceed the derived safety limits. ANSI C95.1-1982 (adopted in 1985 by the FCC) *simply bypassed this problem by an exclusionary clause for low power handheld devices...This exclusionary clause was adopted worldwide by most standard-setting organization, although there was no real scientific back-up for this assumption*[52]*."*

Given this observation, it is unclear why ANSI C95.1-1982 stated it was unlikely excluded devices would exceed the 8 W/kg safety limit, since it seems there was a perception that such excesses would tend to occur.

2.8.2 Statements of federal health agencies

Moreover, the FDA who is considered by the Commission as expert concerning RF exposure to the head due to the use of hand-held portable mobile phones. The Commission notes that,

"FDA, however opposes the ANSI/IEEE radiated power exclusions[60]*. It argues that recently published scientific studies indicate that some hand-held radiotelephones that meet the exclusion criteria for radiated power can be used in a manner that induces SARs exceeding the 1.6 W/kg limit for uncontrolled environments*[61]*."*

It is of interest to note since for the occupational/controlled environment both the SAR limit for localized exposure and the exclusion limit for output power are 5 fold that for the general population/uncontrolled environment[60]. Hence, by allowing the exclusion limit for output power to be 5 fold greater, and allowing the limit for local SAR to be 5 fold greater, leads to the conclusion that high power 'industrial' grade phones which allow workers to be a great distance from a work site transmitter may also result in local SARs exceeding the safety limit. Indeed, it seems that it was this observation, as noted just above, which led to the perception that,

"Right from the onset of the development of the dosimetric concept, it became obvious that handheld mobile telecommunications equipment would exceed the derived safety limits. ANSI C95.1-1982 *simply bypassed this problem by an exclusionary clause for low power handheld devices...This exclusionary clause was adopted worldwide by most standard-setting organization, although there was no real scientific back-up for this assumption*[52]*."*

2.8.3 Some scientists who were members of the RF standard IEEE C95.1-1991 balloting committee (and later adopted as ANSI C95.1-1992) seem to agree with the FDA view that the exclusion provisions in this standard can be expected to allow out-of-compliance SAR exposures to occur.

Dr. Q. Balzano was a member of the balloting committee which approved the RF standard IEEE C95.1-1991, as were 3 members who were from the FDA [It should be noted that these 3 FDA scientist, 2 of the 3 FDA scientists voted against adopting IEEE C95.1-1991]. It is of

interest that in the article of Balzano and Kuster it is stated regarding the portable phone exclusion in this standard that,

"Some equipment, however, need to be operated in the close vicinity of users for functional reasons (e.g. portable and handheld MTE [mobile telecommunications equipment] *). Exclusionary clauses can be defined but should satisfy the worst case criteria. This may not be the case for the exclusionary clause for low power devices defined in ANSI C95.1-1992"*[56].[page 26 of footnote 56]"

Thus, it seems the authors concur that some mobile phones which may have already been authorized by the Commission and in use do exceed the Commission's SAR safety limits.

2.8.4 The Commission should require re-authorization of existing hand-held devices and issue a product recall for those models that do not meet the SAR safety limit, and which limit will be more stringent if the other requests by the Ad-Hoc Association in this proceeding are met. This is a prudent and responsible action and in the public interest, since the above indicates that there is strong evidence that a number of hand-held phones may exceed even the Commission's 1982 SAR limits for local exposure and certainly the Commission's 1996 adopted SAR limits.

While the Commission states, *"it would be impractical to require reauthorization of these devices*[54]" it offers no explanation. Indeed, it is not clear why such a required reauthorization should be impractical - many products including cars are re-called and exchanged. Moreover, given the data showing the safety limits are expected to be exceeded for many devices, to act with prudence and due diligence to protect the public safety the Commission must find itself obliged to require such a reauthorization.

Moreover, given the adverse effects reported herein and elsewhere in this proceeding by the Ad-Hoc Association and other parties, and at SARs which are at or below the 1.6 W/kg allowed for irradiating the head, the necessity to implement such a reauthorization without delay becomes imperative.

2.9 The rationale for exposing the heads of workers to 5 fold higher exposures than allowed to the general public is unsupported by the NCRP[83] rationale upon which the Commission derives its limits, and therefore the exposure to the general population and to workers should be the same, or even less for workers.

The Commission notes[86], that the local SAR for the head it adopted were essentially the same as those in NCRP[83] Section 17.4.5, and the Commission noted the whole body SAR provisions it adopted were based in part upon NCRP[83] Section 17.4.2, as well as ANSI/IEEE C95.1-1992 Sect. 4.2.1 and 4.2.2

2.9.1 NCRP justifies a general population exposure limit being 1/5th of the occupational exposure by noting,

"The rationale for the reduction by a factor of 5 is based on the exposure periods of the two populations, rounded off to one digit (40 hours per week/168 hours per week = ~ 0.2)." [NCRP sect 17.4.2]

This logic appears somewhat internally consistent when applied to whole body exposures from base station transmitters, where irradiation can be continuous throughout an 8 hour or 24 hour period, and exposure is 'passive' - i.e. it occurs while persons are doing other activities and thus can occur throughout the 8 or 24 hour exposure period. (Note elsewhere it is shown that only considering commutative average exposure may not be sufficiently protective (as in item 2.6 above). However, when considering use of portable phones this logic does not hold. The general population does not talk on the phone while it sleeps, eats, or does other activities, except for explicitly speaking on the phone. For example, it is understood that the FDA sets limits for the quantities of some toxins in fish and other food products based on the expected amounts eaten and thus the expected amount of exposure. From readily available data from telecommunications companies it is believed the Commission would find that for non-business accounts the length of time per day on a portable phone is less 1 hour in practically all cases. However, for a worker the situation may be much different, there the job requirements may require regular use throughout the work period; e.g. (i) communication workers who service transmitters and may need to be in regular contact with central operations to coordinate reducing power while they work, (ii) security personnel (iii) dock workers or other field workers needing to relay messages frequently to a central operation. Thus, workers who typically and regularly use hand held phones as part of their job would be expected to be exposed to the head more hours and not less than the general population - hence the logic in NCRP Section 17.4.2 for allowing the worker population to be

exposed to 5 fold higher levels based on potentially realistic lengths of exposure is not valid when applied to cellular phones.

Also, OSHA has specified that, *"Persons exposed above the uncontrolled environment criteria would be protected by a program designed to mitigate any potential increase in risk."*[87,88] Only if the Commission will require in its rules this OSHA requirement, which the Commission has not done and was requested to do by the Ad-Hoc Association, would a greater external power density for workers be appropriate (e.g. if the worker were wearing head protection so that the amount absorbed by the worker's brain would not exceed that allowed for the general public, as specified by OSHA.

2.9.2 Allowing a 5 fold higher exposure for workers is also inconsistent with the ANSI/IEEE C95.1-1992[83] RF guideline rationale. These guidelines provide for worker and general population exposures being the same above 15 GHz for whole body exposures, and allow 1/5th lower exposure levels for the general population for "exposure in the resonant frequency range," and for "low frequency exposure to electric fields...". Since for exposure to the head and when the transmitter is in the near field region, whole body resonant frequency considerations are irrelevant. Also, portable phones do not operate at low frequencies so "low frequency exposure to electric fields" is also not relevant. Since ANSI/IEEE C95.1-1992 states that the rationale for its standard is based on assuming there are no subgroups of the population more at risk than others, and that exposure duration is not a significant risk, or that damage is not cummulative[89], therefore the rationale of NCRP given above would not apply to ANSI/IEEE C95.1-1992. Indeed, once far above the resonant range (at 15 GHz) ANSI/IEEE C95.1-1992 allows the general population to be exposed at the same level as workers (even if in the general population there may be ill persons and persons not aware of or in control of the exposure).

Moreover, for both the ANSI/IEEE C95.1-1992 'controlled' and 'uncontrolled' environments, it is stated that the power densities reported are "not appropriate for near-field conditions"[90]. Thus, according to the basic rationale of ANSI/IEEE C95.1-1992 for the case of above whole body resonant frequencies localized near-field exposure of the worker being 5 fold

higher than that of the general population is unsupported by the rationale of ANSI/IEEE C95.1-1992.

Furthermore, consider the scientific papers that passed the critical review process of the IEEE C95.1-1991 committees. These committees identified well designed, well documented and well analyzed papers and determined which were suitable for use for standard setting[91]. Of these there are 120 papers[92], there are two which provide evidence of pathological effects on the brain at exposure levels below both the hazard threshold of the Commission and the 'safe' exposure limits of the Commission.

Specifically, At 0.01 W/kg[93] (0.25%) *(30 $\mu W/cm^2$)* Indications of breaching of the blood brain barrier.*"...complete functional loss of the tight junctions ...would result in cerebral edema, in increased pressure, and in irreversible brain damage..Perhaps it is coincidental, but the repetition rate of 5 pulses per second falls within the spectrum of intrinsic electrical rhythms of the brain."* [NCRP, 1986] on (Oscar, 1977)[94]. No artifacts from temperature due to low power.

Also, at 0.006 W/kg (approx.)[96] (or about 0.15% of 4 W/kg hazard threshold of the Commission) Male rats at 2380 MHz (12.6 cm wave length) were exposed to power densities of 1000, 50, 25 and 10 $\mu W/cm^2$. *"Thus, it was determined that long-term exposure to NMR (nonionizing microwave radiation) with intensity of 1000 to 10 $\mu W/cm^2$ (3 times a day 40 minutes at a time, for 2 months) elicits changes in the ultrastructure of the hippocampus (of the brain)...The demonstrated changes can most probably effect their function and constitutes one of the elements of pathogenesis of early disturbances in people exposed to this environmental factor."* (Belokrinitskiy, 1982)[95,96].

Also, more recently in 1993, at as low as 0.016 W/kg, there was reported in the peer-reviewed scientific literature a pathological change in the blood-brain-barrier[97].

Therefore, given the above and the policy of the Commission to act "out of an abundance of caution"[92] it follows that based on the information in ANSI/IEEE C95.1 and more recent information that exposure levels to the head of workers should be lower that even the 1.6 W/kg currently allowed for the general population, and certainly not greater.

2.10 26% drop in insulin levels were observed for rats irradiated at 100 microwatts /sq. cm using pulsed signals (400 Hz modulation with pulse duration of 2 microseconds) at 3000 MHz. The estimated whole body average SAR was 0.004 W/kg based on the U.S. Air Force Radiofrequency Radiation Dosimetry Handbook[34].

2.11 Possible adverse mechanisms resulting in tumor suppression

In the Ad-Hoc June 10 Submission, item 7.11 on pages 27-29 described a study in which the exposed laboratory rats had fewer glial cell brain tumors than the 'control' group, suggesting a 'protective' effect[44a,44b,45].

The Commission should know that there is evidence of adverse mechanisms whose impacts could include suppressing tumor growth. Before considering these, please note that a similar pattern also is found regarding x-rays. That is, it is known that high doses of x-ray radiation can kill tumors, and is used as part of cancer radiation therapy - but such radiation treatments also kill healthy tissue and have many other adverse health effects. Thus, just because an exposure suppresses tumors does not imply it is good - it only implies an effect important enough to influence cancer development.

Some possible adverse mechanisms which could account for suppressing of tumor growth are:

(i) perhaps the radio signals are initiating the process of apoptosis (cell death)[46a,b];

(ii) since radio signals at lesser exposures have caused increases in free radicals, these free radicals may have killed the cancer cells[47].

(iii) Also some proteins produced by certain glial cells when activated can kill normal neurons[48a], and brain glial cells may have been stimulated by the radio signals to produce neurotoxins, including certain amino acids[48b] and nitric oxide which can kill cells[48c] including cancer cells (and may be implicated in Altzheimer's disease[49a] for which an association with electric power electromagnetic fields has been observed[49a,b,c]). Such glial protein or glial cell stimulation may occur since the immune system, of which certain glial cells are the brain's immune cell representatives[50], has been observed to be stimulated by radio signals at exposures even lower than in this experiment[51]. In addition, as there is evidence of damage to the blood-brain-barrier at

below the level of some of the exposures [see 2.5.1 and 2.5.2 above] it is possible that the glial cancer cells were more susceptible to cell death to due damage of this barrier.

2.12. Other reports of recent and other biological effects of concern can be found in:

2.12.1 Radio-Frequency and ELF Electromagnetic Fields (1995)[13], Mobile Communications Safety (1997)[14].

2.12.2 Biological Effects of Radiofrequency Radiation by the EPA (1984)[15]

2.12.3 Summary and Results of the April 26-27, 1993 Radiofrequeny Radiation Conference, Vol. 1 which contains an EPA update of RF non-cancer effects prepared in July 1987[16] and Volume 2: Papers[99].

2.12.4 "Electromagnetic Fields, Health Effects," in Encyclopedia of Energy, Technology, and the Environment[100].

2.12.5 "A Case For Reducing Human Exposure Limits Based On Low Level, Non-Thermal, Biological Effects, (1994) by A.H. Doull, Health and Safety Advisor of the Commonwealth Scientific and Industrial Research Organization ("CISRO") and Dr. C.Curtain, CISRO Honorary Research Fellow[101].

2.12.6 "CISRO Report on the Status of Research On the Biological Effects and Safety of Electromagnetic Radiation: Telecommunications Frequencies," June 1994[101].

2.12.7. Neil Cherry, Ph.D. "Potential and Actual Adverse Effects of Cellsite Microwave Radiation", April 1997[103]

2.12.8 A. Frey, "Evolution and Results of Biological Research with Low-Intensity Nonionizing-Radiation"[104], also see 2.13 below.

2.12.9 S. Szmigielski et al., "Immunologic and Cancer-Related Aspects of Exposure to Low-Level Microwave and Radiofrequency Fields"[105]

2.12.10 R.Hitchcock, R. Patterson, Radio-Frequency and ELF Electromagnetic Energies: A Handbook for Health Professionals[63]

2.12.11 A. Furstenberg, "Microwaving Our Planet: The Environmental Impact of the Wireless Revolution" (1996)

2.13 RF effects in the dopamine and opiate systems

The neurotransmitter dopamine is known to have important roles in nerve transmission and in psychological state of mind [104,106,107].

2.13.1 "Docility" measures increased upon exposure of 50 microwatts per sq. cm. of RF . For details see footnote 104 and paper given in 1976. This was consistent with an hypothesis that RF influenced the dopamine system.

2.13.2 Decreases in the enzyme tyrosine hydoxalylase in the brain hypothalmus and brain stem decreased upon exposure to low intensity RF irradiation.[108] This enzyme is needed to make dopamine[104].

2.13.3 Disruption of certain chewing, licking, and gnawing behavior occurred at 8 microwatts per sq. cm10[109]. (and was hypothesized to occur assuming a dopamine influence)104.

2.13.4 Hypothesis of an interaction with the opiate system finds RF effects potentiate morphine effects[104,109,110] and adds evidence that there was a dopamine - opiate system interaction[104].

2.13.5 RF exposure at 200 microwatts/sq. cm. increased the time of rats to respond to a stimulus when they were also given low levels of librium, nalaxone, apomorhine, haloperidol, or morphine[111]. For example, low doses of morphine only had an effect on delaying a response time when there was also RF, i.e. RF had a potentiating effect on the effects morphine at 200 microwatts per sq. cm.

2.13.6 See Frey at footnote 104 (1988) for further studies by other investigators demonstrating an RF effect on dopamine and or the opiate system

2.13.7 Decreases in dopamine: In a peer-reviewed journal it was reported (J. Toler, 1988), "*In fact, the estimated dopamine concentration in the exposure group remained significantly less than that of the sham-exposure group from the initiation of the exposures to the termination of the experiment.*" [page 119 of footnote 112]. "The estimated mean whole body SAR ranged from 0.3 to 0.35 W/kg. Thus, an effect on dopamine levels was independently observed by Toler. This dopamine decrease was also noted in a recent RF biological effects review.

2.13.8 Further evidence of a opiate system RF interaction at 15% of the Commission hazard threshold was found in a series of studies by H. Lai, A. Guy et al.[29,30]. The effect indicated a "deficit in spatial working memory.[29]"

2.13.9 Conclusion: A series of experiments from a number of researchers find effects on systems indicating a dopamine - opiate effect interaction with RF,; these effects disrupt behavior, and occur at levels from 15% of the Commission's hazard level down to 8 microwatts per sq. cm.. The disruption of behavior so noted meets the current 'disruption of behavior' criteria for setting the IEEE C95.1-1991 and NCRP 1986 RF standards, and thus further justify the Ad-Hoc Association FCC 96-326 Petition requests for more stringent exposure limits.

3. The Constitution's 5th and 14th amendments on 'taking', NEPA, the limitations on the Commission of the Telecommunications Act of 1996, and the 10th amendment prohibits preemption of state or local jurisdiction health and safety regulations - all require consideration by the Commission of the impacts of its rules beyond those conclusively proven health effects.

3.1 The National Environmental Protection Act [NEPA] requires that any Commission action deemed to have a significant effect on the quality of the human environment requires the preparation of a Draft Environmental Impact Statement and Final Impact Statement [47 CFR §1.1305]. Now the Commission must acknowledge that the quality of life on the human population needs to be considered beyond considering factors shown conclusively to have adverse health effects . A "reasonable person" who has purchased a home, a community which established a school or hospital, or a partnership or corporation which purchased office or manufacturing buildings can be expected to find it important that people can live, sleep, study, be treated for disease, or work in an environment where there is not anxiety that environmental factors may have the effects described above or in other reports in the record of this proceeding.

3.2 The Commission has overlooked or misunderstood the authority granted to it under the Telecommunications Act of 1996

Limited preemption authority granted to the Commission does not allow preempting 'operation' or preempting zoning or land use of facilities that are not personal wireless services facilities.

The Commission is urged to review the reasons given to the Commission by David Fichtenberg in a Comment of Opposition dated October 8, 1996 pertaining to ET-Docket 93-62 FCC 96-326 in which he shows (i) why the Commission does not have authority to preempt local jurisdiction land use and zoning authority for services that are not personal wireless services facilities, (ii) why it

may not preempt any state or local tort liability jurisdiction, (iii) and why the Commission may not add 'operation' to the list of preempted functions.

The Commission should especially note the "Joint Explanatory Statement" of the Senate/House conference committee which states,

"The conference agreement creates a new section 704 which prevents Commission preemption of local and State land use decisions and preserves the authority of State and local governments over zoning and land use matters except in the limited circumstances set forth in the conference agreement."[21a].

The conference agreement only limits State and local governments over zoning and land use matters regarding the *"placement, construction, and modification*[21b]*"* of personal wireless services facilities on the basis of the environmental effects of radiofrequency emissions. Therefore, per the Joint Explanatory statement, all other functions, including the *"operation"* of such facilities are subject to state and local jurisdiction authority. Also, land use decisions and zoning for other than personal wireless services are not limited by sec. 704 and therefore in accordance with the Joint Exploratory Statement the Commission is prevented from preempting any such state or local jurisdiction land use or zoning authority to regulate those facilities which are not personal wireless services facilities.

3.3 Assure there is no violation of the 5th or 14th amendments including providing for due process and to prohibit the allowing of a 'taking' in a Constitutional sense.

As noted in the Ad Association June 10 submission, the Telecommunications Act of 1996 may have properly delegated responsibilities to the Commission, the Commission must assure that its RF exposure limits do not provide a basis for a reasonable scientific based fear which could thereby affect the uses of property and constitute a 'taking' of that property as so require a court to stay the preemption authority of the Commission.

Consider the following:

"the Court as well decided long ago that 'taking' included destruction or severe impairment of use [Pumpelly v. Green Bay Co. 13 Wall. (80 U.S) 166, 177-178 (1872), Welch v. Swasey, 214 U.S. 91],

and it now holds that,

"property is taken in the constitutional sense when inroads are make upon an owner's use of it to an extent that, as between private parties, a servitude has been acquired either by agreement or in course of time." [United States v. Dickinson, 331 U.S. 745, 748 (1947)].

Consider various Supreme Court and Federal Appeals Court rulings on the "taking" of property. The Supreme Court has ruled that owners of adjacent land deserved compensation because *"noise, glare, and fear of injury"* and other impacts resulted in the adjacent land becoming unfit *"for the use to which the owners had applied it."* [see United States v Causby et al 328 U.S.256, and see Griggs v Allegheny County 369 U.S. 84 because of perceived "noise, vibrations and danger"], and ruled,

"While Congress may legalize, within the sphere of its jurisdiction, what otherwise would be a public nuisance, it may not confer immunity from action for a private nuisance of such a character as to amount in effect to a taking of private property for public use,"

and compensation is due under the 5th Amendment. Richards v Washington Terminal Co. 233 U.S. 546.

Hence, because the record in this proceeding shows there are justifiable, reasonable, science-based evidence for a reasonable person to be anxious about being exposed to RF at levels considered 'safe' by the Commission, such anxiety can make such property, "unfit for the use to which the owners had applied it" in the Constitutional sense described above.

Evidence that such feelings exist which can impair the functioning of a property is found in a policy statement by the New Zealand Ministry of Education[17] and which was included in the Exhibits of the Ad-Hoc Association FCC 96-326 Petition.. The statement notes, "concerns were expressed by some members of the general public and some boards of trustees and parents about the safety of cell phone transmitters on school sites. Then after noting such exposures are within limits of the standards, the policy notes,

"However, of paramount importance to the Ministry is the provision of an environment where boards of trustees, parents, teachers, and pupils and other occupants of the school site can feel comfortable. For this reason the Ministry has decided cellphone transmitters will not be sited on Crown owned school sites in the future."

Likewise, in November 1995, the California Public Utilities Commission, noted it found "no scientific evidence of a definite link between cellular facility EMF exposure and adverse health effects." Yet it was convinced of the reality of public concern and a new release reported that it,

"ordered cellular utilities to identify and address public concerns about potential health problems from electromagnetic field (EMF) and radio-frequency (RF) exposure in siting and

building new cellular towers. It urged cellular companies to site facilities away from schools and hospitals, and to restrict access to sites with warning signs and barriers[18]*."*

Thus it is seen that two governmental bodies, the New Zealand Ministry of Education and the California Public Utilities Commission, have determined that there is sufficient public anxiety about the safety of cellular phone transmission signals as to have the effect of causing a "severe impairment of use." Accordingly, if the Commission allows levels to exceed those which would cause severe anxiety and severe concern to 'reasonable person' knowledgeable about the science based literature in the record of this proceeding or referenced, then the Commission may be 'taking' property, as well as not meeting its NEPA requirements. Thus, the Commission's limits must be sufficiently restrictive so these violations do not occur; for while Congress gave the Commission authority to regulate telecommunications facilities, it did not grant the Commission to set such conditions as would cause serve impairment of use, and cause anxiety destructive to the quality of life.

3.4 The 4th amendment provides for, *"The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated..."* As noted in evidence presented in this proceeding including in these comments, radio frequency signals, especially for those of the newer personal wirelesss services near 900 MHz can more readily penetrate residences as well as the bodies and brains of its occupants. The Ad-Hoc Association has given evidence of cellular phone signals 1/12th of the exposure level considered 'safe' by the Commission which has influenced the amount of REM sleep of adults in a controlled laboratory setting[37]; it has also given evidence which has been replicated and confirmed by different investigators at different laboratories of other biological effects of RF exposures used as a therapeutic regime to affect sleep at levels deemed 'safe' by the Commission[38a,b,c,d,e]. Therefore, exposures with the Commission allows as 'safe' have been demonstrated to be a valid therapeutic treatment - as such these exposure levels should only be allowed when under medical supervision. This effect plus all of the other evidence supporting effects at levels below the hazard threshold of the Commission support more stringent limits, and to allow otherwise would be an invasion of the bodies and minds of persons in their homes which violates the 4th amendment right of persons to be secure in their homes and persons.

Thus, while Congress may have the authority to regulate Commerce and to give authority to the Commission to do so, the Commission may not preempt state and local authority and allow exposure limits with impunity to the safety and welfare of the residents of the nation, and it may not allow exposure levels of RF for which there is a reasonable amount of evidence, if not conclusive, as provided in this proceeding, that the exposure levels allowed by the Commission has effects upon the body which reasonable and informed persons would not willingly permit - and therefore constitutes a violation of the right of persons to be secure in their homes and persons as allowed by the 4th amendment. Specifically, by the Commission permitting exposure levels of radio-frequency which are 1000s of times above that already in the background due to present levels from commercial TV and AM and FM radio and which levels have been shown to have biological effects, the Commission is thereby violating the 4th amendment by violating the right of persons to be secure in their homes and persons. For as noted the 95% of the U.S. urban population was exposed to less than 0.2 microwatts per sq. cm. as reported in 1979, while the Commission's limits range from 200 to 1000 microwatts/sq. cm. for public exposure, a 1000 fold increase over what was the previous typical exposure. When considering this matter the Commission must recognize that radio frequency energy is a physical entity whose presence can be measured both nearby and in the body, and thus to allow levels that are 1000s of times beyond background levels constitutes an invasion of the privacy of persons and violates their right to be secure in their homes, or employees to be secure from the environmental effects of such exposures. Under its right to regulate interstate commerce, Congress may have given the Commission authority to set maximum radio frequency exposure limits for the operation of the facilities of its licensees, but the Commission must assure when implementing this authority that such limits due not violate the 4th amendment rights of persons to be secure in their homes, or in their persons, whether at home, school, in a hospital or at work as described above and elsewhere in this proceeding, and also do not violate other amendments of the Constitution as noted herein and elsewhere in this proceeding..

and *"may enact a law that express adopts or approves of specific state regulation affecting commerce.*[22a]" The courts have acknowledged this authority when deciding that Congress may

set national product health and safety requirements, such as those on automobiles, or cigarette packaging. As these products are sold across state lines, interstate commerce would be near impossible if each state set its own health and safety requirements on such products.

3.5 The Commission does not have the authority to preempt regulation of its facilities on the basis of protecting the public health, safety, and welfare

3.5.1 The Commission does not have the authority to preempt regulating the operation of its facilities, such as regulating transmission signal emission strength, because "operation" was not one of the preempted conditions allowed in the Telecommunications Act of 1996 ("TCA") which are limited to the "placement, construction, and operation" of personal wireless services facilities . For details see item 3.2 above.

3.5.2 Authority given the Commission in Telecommunications Act of 1996 Sec. 704 is superseded by Sec. 253 for health, safety, and welfare related issues

The preemption authority regarding only the regulating of personal wireless services given the Commission in Sect. 704 of the TCA is general and applies generally to the "environmental effects of radio frequency emissions." The preemption says nothing specifically about public health, safety, or welfare. In November 1996, after the TCA came into effect, after the Commission released its adopted new rules in August, 1996, and after the deadline for submitting Petitions for Reconsideration, a State of Illinois Appellate Court determined,

"The FCC regulates the frequency, channel spacing, and power limitations for cellular telephone use. The FCC also regulates who may provide cellular telephone services and how these service providers must structure their businesses. Therefore, the FCC does not have the responsibility for public safety with regard to cellular telephones as its responsibilities lie in regulating radio frequency standards. Accordingly, since Congress has not empowered the FCC to regulate cellular telephones with regard to health effects and public safety, it has not regulated so pervasively as to preclude state action on that subject. Therefore, the FCC regulations cannot preempt a state's power on the issue in the instant case, i.e. whether cellular telephones are unsafe and pose an increased health risk to plaintiffs." [Verb v. Motorola, Inc. 672 N.E.2nd 1287 (Ill.App.1 Dist. 1996]

Since the authority given the Commission to regulate its base stations is similar in scope to that given the Commission to regulate emissions from mobile hand-hand phones, and in neither case did Congress make reference in Section 704 to preempting regulations "*with regard to health effects and public safety*" [Id. Verb v Motorola at 1293], it therefore follows that the Commission